



ARMOR SHIELD® Desiccant Technical Data

Product Description

Desiccants are drying agents used to quickly reduce the humidity inside a closed container to a predetermined lower value and then to maintain the humidity at that lower level for a period of time. ARMOR offers a full variety of packaged desiccants ranging from 0.25 grams to 2,500 grams (including 1/6 Unit to 80 Unit sizes). Primary types of desiccants are Clay and Silica Gel.

A Unit of desiccant refers to its drying capacity, not its volume. The true definition is the quantity of desiccant required to meet the U.S. Military's specification (MIL-D-3464E) for packaged desiccant products. Under this specification, a unit is the quantity of desiccant which will adsorb 3.00 grams of water vapor at 20% relative humidity or 6.00 grams of water vapor at 40% relative humidity at 77°F (25°C). It may also be helpful to think of a unit as equating to approximately one ounce of material or 30 grams.

Product Details

- Desiccants operate via adsorption, meaning they won't release moisture back out of the desiccant
- The most common desiccant for industrial applications is Clay/Tyvek
- Shelf life of desiccant sealed in its original container is at least 5 years

CLAY (pkg'd by unit) desiccants available in:

- Standard sizes: 1/6, 1/3, 1/2, 1, 2, 4, 8, 16, and 80 units.
 - Tyvek® (heat sealed) * *Most common for industrial*
 - Kraft Paper (heat sealed) Normally not suited for corrosion issues
 - Sewn Cloth (string sewn)
- Most economical desiccant
- Highly effective within normal temperature and relative humidity
- Used in industrial applications mostly
- Clay can adsorb up to 30% of it's weight in water vapor (at 77°F (25°C) and 80% RH)
- No apparent change in size/shape/texture at full capacity

SILICA GEL desiccants available in:

- Standard sizes: 1/4, 1/2, 1, 2, 3, 5, and 10 grams.
- Tyvek® (heat sealed)
- GDTII (heat sealed), Meets all Mil Specs for desiccants (MIL-D-3464, Type I & II)
- Overall, high efficiency and high capacity desiccant



- Will adsorb about 40% of its weight in water vapor at 100% humidity
- Better suited than clay for temperatures above 120°F (49°C) (clay may give up moisture rather than pull it in at this temperature)

Calculation Example:

Container: 54x44x96 inches

- Parts inside container take up 70% of space
- Want to desiccate container

- $54 \times 44 \times 96 = 228,000$ cubic inches
- Multiply by (0.3) for 30% void air space = 64,000 cubic inches
- Use ARMOR SHIELD Desiccant Formula Chart for assistance
- Find 64,000 cubic inches and round up (note 71,429 on chart)
- Answer: 50 units are required to desiccate this container
 - Any combination of unit sizes to make 50 units is acceptable
 - Example: 3 or 4 – 16 oz. units or 6 or 7 – 8 oz. units
- See chart below for desiccant requirements



DESICCANT REQUIREMENT CHART

* **UNIT BAGS** (Silica Gel Beaded (Tyvek) & Clay (Tyvek))

VOLUME			AREA	SQUARE FEET	UNITS REQUIRED
CUBIC INCHES	CUBIC FEET	GALLONS	SQUARE INCHES		
237	0.14	1.10	15	0.10	1/6
476	0.28	2.10	30	0.20	1/3
715	0.42	3.20	45	0.30	1/2
1,429	0.83	6.20	90	0.60	1
2,857	1.67	12.50	180	1.30	2
4,286	2.50	18.70	270	1.90	3
5,714	3.33	25.00	360	2.50	4
7,143	4.17	31.20	450	3.10	5
8,571	5.00	37.40	540	3.80	6
10,000	5.83	43.60	630	4.40	7
11,423	6.67	50.00	720	5.00	8
12,857	7.50	56.10	810	5.60	9
14,286	8.33	62.30	900	6.30	10
17,143	10.00	74.80	1,080	7.50	12
20,000	11.67	87.30	1,260	8.80	14
22,857	13.33	99.70	1,440	10.00	16
28,571	16.67	125.00	1,800	12.50	20
42,857	25.00	187.00	2,700	18.80	30
57,143	33.33	249.00	3,600	25.00	40
71,429	41.67		4,500	31.30	50
85,714	50.00		5,400	37.50	60
100,000	58.30		6,300	43.80	70
114,286	66.67		7,200	50.00	80

PILLOW PAKS

CONTAINER SIZE	REQUIRED AMOUNT (GRAMS)		
	CUBIC CM	SILICA GEL	ACTIVATED CARBON
30	1/8	1/4	1/4
40	1/4	1/4	1/4
50	1/2	1/4	1/4
60	1/2	1/2	1/2
75	3/4	1/2	1/2
100	1	1	1
150	1	1	1
200	2	2	2
300	2	2	2
400	3	2	3
500	3	2	3
750	5	2	5
950	5	5	5

* A unit of desiccant refers to its drying capacity, not its volume. A unit (approx. one ounce) is the amount of Montmorillonite Clay which will adsorb at least three grams of water vapor at 20% relative humidity and at least six grams of water vapor at 40% relative humidity at 77°F. (25°C)



Questions

Please contact the Technical Services department at ARMOR Protective Packaging® for further questions. Wes Measel at wmeasel@armorvci.com or Robin McConnell at rmcconnell@armorvci.com , Phone (1) 517-546-1117.

All products manufactured by ARMOR Protective Packaging® are warranted to be first class products and free from defects in material and workmanship. Liability under this warranty is limited to the net purchase price of any of such products proven defective or at our option to the repair or replacement of said products upon their return to us transportation prepaid. All claims on defective products must be made in writing 30 days after the receipt of such products in your plant and prior to further processing or combining with other materials and products. We make no warranty, express or implied, as to the suitability of any of our product for any particular use, and we shall not be subject to liability from any damages resulting from their use in operations not under our direct control. This warranty is exclusive of all other warranties, express or implied, and no representative of ours or any other person is authorized to assume for us any other liability in connection with the sale of our products.

Revised 8-6-10